APPLIED GEOGRAPHY

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THE term which I have taken for the title of my address has been in use for some years as a general designation of lendings or borrowings of geographical results, whether by a geographer who applies the material of his own science to another, or by a geologist or a meteorologist, or again an ethnologist or historian, who borrows of the geographer. Whether geography makes the loan of her own motion or not, the interest in view, as it seems to me, is primarily that, not of geography, but of another science or study. The open question whether that interest will be served better if the actual application be made by the geographer or by the other scientist or student does not concern us now.

Such applications are of the highest interest and value as studies, and, still more, as means of education. As studies, not merely are they links between sciences, but they tend to become new subjects of research, and to develop with time into independent sciences. As means of education they are used more generally, and prove themselves of higher potency than the pure sciences from which or to which, respectively, the loans are effected. But, in my view, geography, thus applied, passes, in the process of application, into a foreign province and under another control. It is most proper, as well as most profitable, for a geographer to work in that foreign field; but, while he stays in it, he is, in military parlance, seconded.

Logical as this view may appear, and often as, in fact, it has been stated or implied by others (for example, by one at least of my predecessors in this chair, Sir Charles Close, who delivered his presidential address to the section at the Portsmouth Meeting in 1911), it does not square with some conceptions of geography put forward by high authorities of recent years. These represent differently the status of some of the studies, into which, as I maintain, geography enters as a subordinate and secondary element. In particular, there is a school, represented in this country and more strongly in America, which claims for geography what, in my view, is an historical or ethnological or even psychological study, using geographical data towards the solution of problems in its own field; and some even consider this not merely a function of true geography, but its principal function now and for the future. Their 'new geography' is and is to be the study of 'human response to land-forms.' This is an extreme American statement; but the same idea is instinct in such utterances, more sober and guarded, as that of a great geographer, Dr. H. R. Mill, to the effect that the

ultimate problem of geography is 'the demonstrative and quantitative proof of the control exercised by the Earth's crust on the mental processes of its inhabitants. Dr. Mill is too profound a man of science not to guard himself, by that saving word 'ultimate,' from such retorts as Professor Ellsworth Huntington, of Yale, has offered to the extreme American statement. If, the latter argued, geography is actually the study of the human response to land-forms, then, as a science it is in its infancy, or, rather, it has returned to a second childhood; for it has hardly begun to collect exact data to this particular end, or to treat them statistically, or to apply to them the methods of isolation that exact science demands. In this country geographers are less inclined to interpret 'new geography' on such revolutionary lines; but one suspects a tendency towards the American view in both their principles and their practice—in their choice of lines of inquiry or research and their choice of subjects for education. The concentration on man, which characterizes geographical teaching in the University of London, and the almost exclusive attention paid to Economic Geography in the geographical curricula of some other British Universities make in that direction. In educational practice, this bias does good, rather than harm, if the geographer bears in mind that Geography proper has only one function to perform in regard to man—namely, to investigate, account for, and state his distribution over terrestrial space—and that this function cannot be performed to any good purpose except upon a basis of Physical Geography—that is, on knowledge of the disposition and relation of the Earth's physical features, so far as ascertained to date. To deal with the effect of man's distribution on his mental processes or political and economic action is to deal with him geographically indeed, but by applications of geography to psychology, to history, to sociology, to ethnology, to economics, for the ends of these sciences; though the interests of geography may be, and often are, well served in the process by reflection of light on its own problems of distribution. If in instruction, as distinct from research, the geographer, realising that, when he introduces these subjects to his pupils, he will be teaching them not geography, but another science with the help of geography, insists on their having been grounded previously or elsewhere in what he is to apply—namely, the facts of physical distribution—all will be well. The application will be a sound step forward in education, more potent perhaps for training general intelligence than the teaching of pure geography at the earlier stage, because making a wider and more compelling appeal to imaginative interest and pointing the adolescent mind to a more complicated field of thought. But if geography is applied to instruction in other sciences without the recipients having learned what it is in itself, then all will be wrong. The teacher will talk a language not under-

stood, and the value of what he is applying cannot be appreciated by the pupils.

If I leave this argument there for the moment, it is with the intention of returning to it before I end today. It goes to the root, as it seems to me, of the unsatisfactory nature of much geographical insruction given at present in our islands. The actual policy of the English Board of Education seems to contemplate that geography should be taught to secondary students, only in connection with history. If this policy were realised in instructional practice by encouragement or compulsion of secondary students to undergo courses of geography proper, with a view to promotion subsequently to classes in historical geography (*i. e.*, if history be treated geographically by application of another science previously studied), it would be sound. But I gather from Sir Halford Mackinder's recent report that such is not the practice. Courses in geography proper are not encouraged during the secondary period of education at all. Encouragement ceases with the primary period, at an age before which only the most elementary instruction in such a science can be assimilated—when, indeed, not much more can be expected of pupils than the memorising of those summary diagrammatic expressions of geographical results, which are maps. How these results have been arrived at, what sort of causes account for physical distribution, how multifarious are its facts and features which maps cannot express even on the minutest scale—these things must be instilled into minds more robust than those of children under fourteen; and until some adequate idea of them has been imbibed it is little use to teach history geographically. So, at least, this matter seems to me.

It will be patent enough by now that I am maintaining geography proper to be the study of the spatial distribution of all physical features on the surface of this earth. My view is, of course, neither novel nor rare. Almost all who of late years have discussed the scope of geography have agreed that distribution is of its essence. Among the most recent exponents of that view have been two directors of the Oxford School, Sir Halford Mackinder and Professor Herbertson. When, however, I add that the study of distribution, rightly understood, is the whole essential function of geography, I part company from the theory of some of my predecessors and contemporaries, and the practice of more. But our divergence will be found to be not serious; for not only do I mean a great deal by the study of distribution—quite enough for the function of any one science!—but I claim for geography to the exclusion of any other science all study of spatial distribution on the earth's surface. This study has been its well recognised function ever since a science of that name has come to be restricted to the features of the terrestrial surface—that is, ever since 'geography' in the eighteenth century had to abandon to its child geo-

logy the study of what lies below that surface even as earlier it had abandoned the study of the firmament to an elder child, astronomy. Though geography has borne other children since, who have grown to independent scientific life, none of these has robbed her of that one immemorial function. On the contrary, they call upon her to exercise it still on their behalf.

Let no one suppose that I mean by this study and this function merely what Professor Herbertson so indignantly repudiated for an adequate content of his science—physiography *plus* descriptive topography. Geography includes these things, of course, but she embraces also all investigation both of the actual distribution of the earth's superficial features and of the causes of the distribution, the last a profound and intricate subject towards the solution of which she has to summon assistance from many other sciences and studies. She includes, further, in her field, for the accurate statement of actual distribution, all the processes of survey—a highly specialised function to the due performance of which other sciences again lend indispensable aid; and, also, for the diagrammatic presentation of synthetised results for practical use, the equally highly specialised processes of cartography. That seems to me an ample field, with more than sufficient variety of expert functions, for any one science. And I have not taken into account either the part geography has to play in aiding other sciences, as they aid her, by application of her data, or, again, certain investigations of terrestrial phenomena, at present incumbent upon her, because special sciences to deal with them have not yet been developed—or, at least, fully developed—although their ultimate growth to independence can be foreseen or has already gone far. Such, for the moment, are geodetic investigations, in this country at any rate. In Germany, I understand, geodesy has attained already the status of a distinct specialism. Here the child has hardly separate existence. But beyond a doubt it will part from its parent, even as oceanography has parted. Indeed some day, in a future far too distant to be foreseen now, many, or most, of the investigations which now occupy the chief attention of geographical researchers may cease to be necessary. A time must come when the actual distribution of all phenomena on the earth's surface will have been ascertained, and all the relief upon it and every superficial feature which cartography can possibly express in its diagrammatic way will have been set out finally on the map. That moment, however, will not be the end of geography as a science, for there will still remain the investigation of the causes of distribution, the scientific statement of its facts, and the application of these to other sciences. Let us not, however, worry about any ultimate restriction of the functions of our science. The discovery and correlation of all the facts of geographical distribution and their final presentation in diagram-

matic form are not much more imminent than the exhaustion of the material of any other science!

In the meantime, for a wholly indeterminate interval, let us see to it that all means of investigating the phenomena of spatial distribution on the earth be promoted, without discouragement of this or that tentative means as unscientific. The exploration of the terrestrial surface should be appreciated as a process of many necessary stages graduated from ignorance up to perfect knowledge. It is to the credit of the Royal Geographical Society that it has always encouraged tentative, and, if you like, unscientific first efforts of exploration, especially in parts of the world where, if every prospect pleases, man is very vile. Unscientific explorations are often the only possible means to the beginning of knowledge. Where an ordinary compass cannot be used except at instant risk of death it is worth while to push in a succession of explorers unequipped with any scientific knowledge or apparatus at all, not merely to gain what few geographical data untrained eyes may see and uneducated memories retain, but to open a road on which ultimately a scientific explorer may hope to pass and work, because the local population has grown, by intercourse with his unscientific precursors, less hostile and more indifferent to his prying activities. There seems to me now and then to be too much criticism of Columbus. If he thought America was India he had none the less found America.

I have claimed for the geographer's proper field the study of the causation of distribution. I am aware that this claim has been, and is denied to geography by some students of the sciences which he necessarily calls to his help. But if a science is to be denied access to the fields of other sciences except it take service under them, what science shall be saved? I admit, however, that some disputes can hardly be avoided, where respective boundaries are not yet well delimited. Better delimitation is called for in the interest of geography, because lack of definition, causing doubts and questions about her scope, confuses the distinction between the science and its application. The doubts are not really symptoms of anything wrong with geography, but, since they may suggest to the popular mind that in fact something is wrong, they can be causes of disease. Their constant genesis is to be found in the history of a science, whose scope has not always been the same, but has contracted during the course of ages in certain directions while expanding in others. If, in the third century B. C., Eratosthenes had been asked what he meant by geography, he would have replied, the science of all the physical environment of man whether above, upon, or below the surface of the earth, as well as of man himself as a physical entity. He would have claimed for its field what lies between the farthest star and the heart of our globe, and the nature and relation of everything composing the universe. Geography, in fact, was then not only the whole of natural science, as we understand the term, but also

everything to which another term, ethnology, might now be stretched at its very widest.

Look forward now across two thousand years to the end of the eighteenth century A. D. Geography has long become a mother. She has conceived and borne astronomy, chemistry, botany, zoology, and many more children, of whom about the youngest is geology. They have all existences separate from her and stand on their own feet, but they preserve a filial connection with her and depend still on their mother science for a certain common service, while taking off her hands other services she once performed. Restricting the scope of her activities, they have set her free to develop new ones. In doing this she will conceive again and again and bear yet other children during the century to follow—meteorology, climatology, oceanography, ethnology, anthropology and more. Again, and still more narrowly, this new brood will limit the mother's scope; but ever and ever fecund, she will find fresh activities in the vast field of earth knowledge, and once and again conceive anew. The latest child that she has borne and seen stand erect is, as I have said, geodesy; and she has not done with conceiving.

Ever losing sections of her original field and functions, ever adding new sections to them, geography can hardly help suggesting doubts to others and even to herself. There must always be a certain indefiniteness about a field on whose edges fresh specialisms are for ever developing toward a point at which they will break away to grow alone into new sciences. The mother holds on awhile to the child, sharing its activities, loth to let go, perhaps even a little jealous of its growing independence. It has not been easy to say at any given moment where geography's functions have ended and those of, say, geology or ethnology have begun. Moreover, it is inevitably asked about this fissiparous science from which function after function has detached itself to lead life apart—what, if the process continues, as it shows every sign of doing, will be left to geography later or sooner? Will it not be split up among divers specialisms, and become in time a venerable memory? It is a natural, perhaps a necessary, question. But what is wholly unnecessary is that any answer should be returned which implies a doubt that geography has a field of research and study essentially hers yesterday, to-day, and to-morrow; still less which implies any suspicion that because of her constant parturition of specialisms geography is, or is likely in any future that can be foreseen, to be moribund.